

Legacy Builder

Published by Legacy Press, A division of Phantom Engineering, Inc.

www.legacywoodworking.com

VOLUME ONE - 2003



THIS ISSUE FEATURES

Legacy Builder:

Dean Mohring
Rockton, IL

Featured Project:

Round Entry Table

Technique:

Undercutting vs.
Climb Milling

Tips & Tricks:

Template Follower
Using the double
locking collar

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Dean Mohring grew up in woodworker's Nirvana. Well, technically, Dean grew up on the Wisconsin/Illinois state line in a town called Rockton, Illinois, but it was close enough. As a child, Dean's favorite toys weren't a Captain Lazor 12" Action Figure or a Wild West Tin Litho Marble Game board, they were a hammer & a saw. Every year for his birthday and Christmas, Dean's Grandparents gave him a screwdriver or a chisel or another tool of some sort. And to put the icing on the cake, Dean even had a close neighbor with a saw mill which is exactly what Dean wanted when he grew up. Well, grew up he did, though growin' up's not always what you dream it's gonna be (or pay how you think it should). Dean eventually chose to pursue a degree in Agriculture/Food Science. He worked at Oscar Meyer by nights and during the days he worked for a cabinet company, because his heart never left woodworking (even if his wallet demanded that it should). Fortunately



"The Legacy has a lot of capability, even so, we like to keep our designs stylish, simple & elegant. This is what the customers we build for want; even if we would like to show off a few spirals once in a while".

"I would hate for too many woodworkers to own a Legacy, because it would definitely cut into my business."



though, Dean Mohring has never been one of those people who let their good sense lead their heart & Dean knew that someday, he would do what he loved full time . . . he just had to figure out a way to really make it pay.

At the age of 52, when he could stand it no longer, Dean retired & bought a saw mill with 2 kilns & built a shop near his homestead. Bound and determined to unite his head and his heart, Dean set up his own cabinet business, Rockton Hardwood Products. Unlike many successful cabinet businesses, Dean & RHP chose to skip the easy route of purchasing pre-cut, pre-fabricated cabinet pieces and follow the romance of Mother Nature. Yes

The 2-dimensional template (right) attaches to the template mounting brackets of the Legacy. Following the pattern with a 1/2" brass stylus allows the router to shape a 3-dimensional piece.



These pieces were used as table legs on the entry table pictured on the previous page.

folks, Rockton Hardwood Products cuts their own lumber then they dry the lumber in kilns and use this wood as the medium for their craft (and, of course, sell a little of their local treasure to those less fortunate). It took a couple of hard years for Dean and RHP to find the Shangri-la they now enjoy, but it all started to come together when they met a fellow in high end cabinetry who really liked their work. He invited Dean and his company to help him in a couple of jobs and the rest is history. RHP has decided that high end is the place to be; their niche in the market, so to speak. And it seems to work very well for them, considering that RHP gets most of their business by word of mouth & they have orders scheduled at least 6 months in advance.

At the first hint of true success, Dean began to look for a new tool that would help RHP in their endeavors. He had been eyeballing Legacy's Ornamental Mill from it's infancy, but couldn't justify making the purchase until the machine was just right for RHP's needs. However, after they got a bid for one home near Lake Geneva (a bid for over \$100,000 worth of

Using the Legacy Model 1000 you can create columns up to 10 1/2" diameter. The rotary indexing table allows you to create the cap pieces up to 14 1/2" diameter.

cabinetry), Dean started looking a little harder. Dean immediately sent for one of Legacy's CD-ROMs and decided that the Legacy was finally looking like it was in a stage that would work best for them. And work it did. To make a long story short, Rockton Hardwood Product's Legacy paid for itself in 3 projects.

Most often, RHP's clients show them a picture & say make this, but modify it in this way. The team at RHP does a lot of planning to get things just so. Each piece gets it's own CAD drawing reviewed by the client before any of the work begins. RHP guarantees each and every piece they produce. If a customer doesn't like the finished product, they don't own it, however, they have never had to keep a single piece.

Obviously Dean Mohring is a fairly accomplished woodworker. So why does he need a Legacy Ornamental Mill? According to Dean, his Legacy helps get the job done faster, and with more accuracy. Before their purchase, RHP had to use a steam bending method to mold many parts. Anyone who has ever followed this process knows how difficult it is and how much time it takes. *"This machine is a real time saver, to steam bend means hours and hours of work. I also like the ability to run patterns. I used to have to round corners by hand or turn them on the lathe. Now we do them much quicker and with greater accuracy. This machine has really sped up production time and the repeatability is excellent. I only wish it were bigger, wider, deeper, longer - but mostly bigger!"* Even so, Dean Mohring and Rockton Hardwood Products are extremely pleased with their Legacy Ornamental Mill. Dean recommends it to friends often - though not too often. *"I would hate for too many woodworkers to own a Legacy, because it would definitely cut into my business."*



"The same customer requested the chairs (above) for around his pool table. Making the mortise and tenons on the thick legs and rails had us stumped until we thought of the Legacy. We achieved a perfect fit."



"The rounded corners were "a piece of cake" on the mill. We glued up 4 squares, 1 1/2" by 30 inches long, with kraft paper in between. They were turned round on the mill and split back into four pieces on the paper seams."

"I used to have to round corners by hand or turn them on the lathe. Now we do them much quicker and with greater accuracy. This machine has really sped up production time and the repeatability is excellent."

HOW TO: Against the Grain?

Undercutting vs. Climb Milling

Problem: When milling stock following a template and also when milling flat stock using a surface planing or bottom cleaning bit, it is easy to create tearout of material if your not sensitive to the direction of the cut.

Solution: Creating clean cuts (without tearout) can best be achieved by understanding the difference between climb milling and under-cutting.

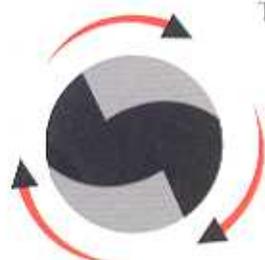


Fig. A

The first thing we need to understand is the rotation of the router bit. In a traditional router table the cutter rotates in a counter-clockwise direction. On the Legacy however, the router is positioned such that the rotation of the cutter is in a clockwise direction (Fig. A) Therefore, if the router is cutting on the back side of the material (the side opposite the operator), under-cutting would occur if we were milling from the headstock end to the tailstock end (Fig. B).

If we are milling from the tailstock to the headstock we would be climb milling (Fig. C).

The opposite is true if the cut is made from the front side, or the operator side of the machine.

Under-cutting the material is the cause of tearout. As the cutter comes out of the material it will lift the grain on the outside edge. To alleviate the tearout it is best to

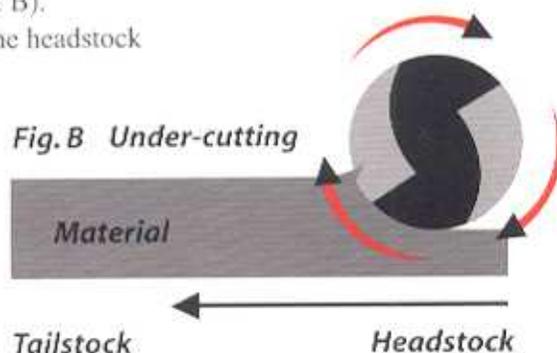


Fig. B Under-cutting

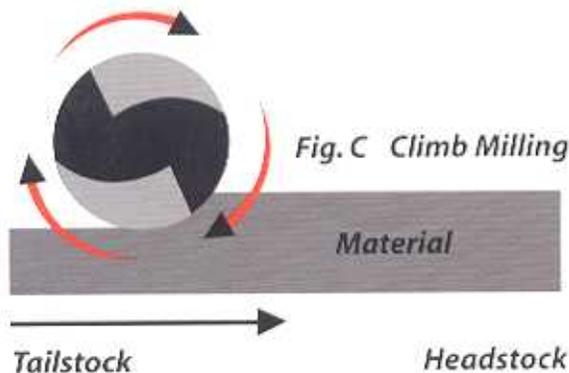


Fig. C Climb Milling

Drawings show a top view of router bit rotation while cutting material from the side using a side cutting bit (Upcut spiral or double-flute straight cutter) and the template follower technique.

climb mill the workpiece. When climb milling the router bit cuts into the grain and will always create a cleaner cut.

The problem with climb milling however, is that as the router bit rotates into the wood it responds much like an automobile tire on the road, as it grabs the material it causes the router to run along the length of the piece. Traditional woodworking teaches us that it is unsafe to operate a router in this manner.

The Legacy however, allows you to control this tendency to run by locking the split-nut onto the x-axis (long) lead screw, and advance the router forward (from tailstock to headstock) by rotating the drive shaft. As the router is advanced, and because of the clockwise rotation of the bit, the router has a tendency to pull into the material; hence when following a pattern and cutting from the side, the template and stylus work together as stops, controlling the depth of the cut.

Locking the split-nut onto the x-axis lead screw is particularly important when there is lots of material for the bit to chew into. You may find that once the first side has been milled, and you're no longer milling the full width of the material, the consecutive cuts are smaller cuts and the router can be controlled freehand or without the use of the lead screw.

More template following tips

- ◆ In lieu of rotating the workpiece while following a template, try using the index head and locking the workpiece into place. As you hit every hole in the plate you will be surprised at just how close to round the workpiece will finish out creating 24, 36, or 40 sides (depending on index plate used, see Fig. D).

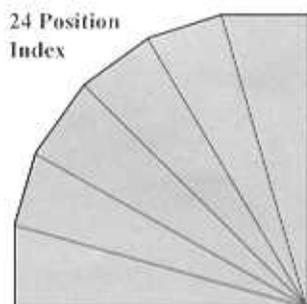
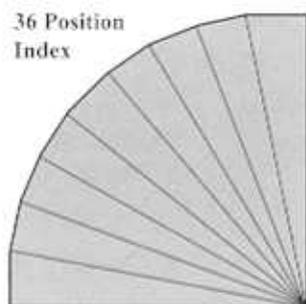
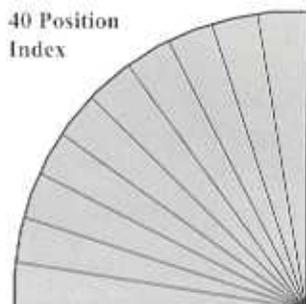


Figure D - End View, 6 sides at 15 degree intervals



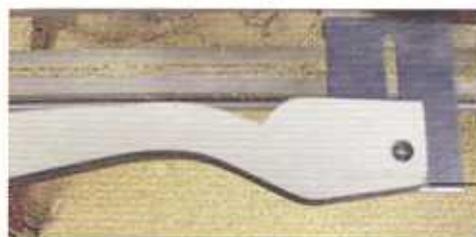
End View, 9 sides at 10 degree intervals



End View, 10 sides at 9 degree intervals

- ◆ Try removing as much material as possible before following the pattern. Use a bandsaw to rough out material, or in some cases you can use a surface-planing bit or large core box bit from the top to quickly remove stock. Obviously the less material that is removed while cutting from the side, the faster the job will be completed. Keep in mind that the cutting depth of the side-cutting bit limits how much material can be removed at a time.

- ◆ If your design calls for a squared off edge (90 degrees) and then a transition into a round, such as a cabriolet style table leg, this technique may help. Follow the pattern and cut the 2 outside profiles at 90 degrees (6 hole difference using the 24 position index head). Once these 2 sides have been cut, release the wingnut holding the template on the end you want left square. Slide the end of the template out 1/4" to 1/2" and lock it into place. Now use the 4 remaining holes to surface off the area you desire to be round. Since the template has been kicked out on one end it will keep the bit from cutting the material, yet will allow a smooth transition as it cuts the material on the rounded end.



- ◆ When using a side-reeding or side-fluting bit to put reeds or flutes on a contoured piece you will find it helpful to remove the bearing on the end of the bit and let the template determine the depth of the cut from the side. Using the template instead of the bearing will give you a cleaner cut on the piece, particularly when the final reed/flute is cut. If you use the bearing as the determining factor for the depth of cut, invariably the final cut will come out unevenly - that is because the bearing ends up falling into the first reed/flute created.



Bearing on the end of a side-reeding bit



Bearing removed



Notice that the bearing would fall into the reed created by the first cut.

Using the double-locking collar

Photo A



Photo B



Photo C



Photo D



Problem: It often becomes difficult when using the indexing system (Photo A) to make minor adjustments to the workpiece in order to get it square to the router. This is of particular concern when the stock is larger diameter and it becomes more critical that the workpiece be truer to square. This is also true when the hub is not mounted exactly square to the material (Photo B). In the past the best solution was to release the #2 morse taper on the index drive center, mount the material into the machine, square it up to the router and then remove the material so that you could reset the #2 morse taper.

Solution: The double-locking collar (\$19.00) is a great solution to this problem because it means that the #2 morse taper never has to be set, as a result you never have to worry about the drive center slipping. This also works nicely if you wish to take the part back and forth between the Legacy and your lathe.

How it works: Two collars are welded together. One collar is threaded (1" x 8tpi) and mounts onto the spindle shaft before it is locked into place. The second collar is plain and locks onto the index drive center. As a result the morse taper on the index drive center never has to be set, and minor adjustments to make the material square to the router are easy.

- 1) Lock the indexing pin into place. (Photo A)
- 2) Release the capscrew on the unthreaded collar.
- 3) Position the workpiece as needed. (Photo C)
- 4) Tighten the capscrew on the locking collar. (Photo D)



Top Right
Double-locking collar threaded onto the spindle shaft.



Bottom Right
Index drive center locked on with the double-locking collar.



< Horizontal Bench Vise -

Set of 2 adjustable camlock vises that mount to either the fixed rails for level material up to 6/4 stock, or on the adjustable rails of the machine for thicker material and for tapering. (also fits old style Legacy)

cost is \$99.00

Vertical Bench Vise -

Mounts to the Horizontal Bench Vise and allows for vertical clamping of material. Create mortise, tenons, dovetails, finger joints, etc. on the ends of material up to 10" wide. (Requires the use of the Horizontal Vise). (also fits old style Legacy)

cost is \$109.00

V



Circle Cutting > Center

Mounts to the new horizontal bench vise and allows you to create a pivot point using a 1/2" brass stylus (the same stylus used with the template/pattern follower).

Allows for the cutting of large round (no oval) circles for table tops, arches, frames, moulding, etc. (see Dean Mohring entry table on page 1 or Gate-Leg Table and Grape Arbor on page 8)

cost is \$19.00



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